

IN THE SPECIFICATION

Please replace the paragraph beginning on page 1, line 19 with the following replacement paragraph:

The present application is related to an issued US Patent, No. 5,414, 259, issued to Howard M. Kingston on May 9, 1995, incorporated herein in its entirety by reference, to a co-pending patent application S/N 09/015,469, filed January 29, 1998, also incorporated in its entirety by reference, and to a provisional patent application filed January 29, 2001, bearing S/N 60/264748, now U. S. Serial No. 10/004,627 filed December 4, 2001, which is also incorporated herein in its entirety by reference..

Please replace the paragraph beginning on page 2, line 13 with the following replacement paragraph:

In a preferred embodiment the system of the invention uses a modified form of Isotope Dilution Mass Spectrometry (IDMS), known to the inventors as Speciated Isotope Dilution Mass Spectrometry (SIDMS). The exemplary method is an elemental and speciation threshold measurement method that is optimized for quality assurance at and near instrumental detection limits. The threshold measurement method is automated for unattended operation, and describes an In-process, Atmospheric Pressure Ionizer, Mass Spectrometer (IP-API-MS). The IP-API-MS apparatus is designed for identification and quantification of elemental contaminants or compounds and species in fluids, and in the exemplary case, liquid solutions.

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Please replace the paragraph beginning on page 4, line 17 with the following replacement paragraph:

~~In one embodiment, the~~ THE present inventors have chosen an enhancement of a known technique for achieving calibration-free mass spectrometry measurements. The known technique is Isotope Dilution Mass Spectrometry, hereinafter IDMS. In IDMS, one takes advantage of well-known, naturally-occurring isotope ratios in essentially all elements. For example, it is well-known that the average atomic mass of copper (Cu) in the natural state is 63.546, consisting of isotopes 62.9396 at 69.2% and 64.9276 at 30.8%. Very generally speaking, assuming an analysis for Cu content is required, one takes a sample of the solution to be analyzed, spikes the sample with an enriched standard solution having a substantially different isotope ratio than the naturally-occurring ratio, introduces the spiked sample to a mass spectrometer, and records the measured mass ratio between the isotopes. The measurement is going to differ from the naturally-occurring ratio and the standard spike ratio, and from the measured ratio, knowing the quantity of the original sample, and the quantity of the spike solution, one can calculate the single unknown, that being the concentration of Cu in the original sample.

Please replace the paragraph beginning on page 5, line 29 with the following replacement paragraph:

It will be apparent to the skilled artisan that employing the patented techniques of the above-referenced patent to Kingston is an excellent first step in accomplishing full-time, real-time mass spectrometry analysis of fluid systems, but that there are many other challenges in sample collection, sample handling, sample spiking, dilution, control, and

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many other areas to accomplish such a robust measurement and control system in real applications, such as in wet-bath analysis in semiconductor manufacturing, which has been selected as an exemplary application for describing the apparatus and methods of the present invention..

Please insert the following new paragraphs beginning on page 18, line 31:

Speciated Isotope Dilution Mass Spectrometry (SIDMS), as described in the '259 patent to Kingston referenced above, has been developed to assess the quantification of species and also their transformations. In SIDMS a predetermined species is specifically isotopically labeled and introduced to accomplish such measurements. The species of interest is previously known and specifically evaluated. In this invention the labeled species (frequently multiple species simultaneously) are being created in solution and are not previously determined in composition and structure until evaluated for structural information. Quantification is of the elemental ion and speciation information first established in-process through dynamic equilibrium established with a non-complexing salt of an enriched stable isotope in real time and in-process.

In the SIDMS method, as enabled in embodiments of the present invention, one may accomplish unattended operation of an apparatus that will accurately monitor elemental concentration threshold levels, identify, and quantify elemental contaminants or compounds and species in fluids. Unlike traditional IDMS this method enhances and improves measurement at and near the detection limit of mass spectrometers.

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Please replace the paragraph beginning on page 19, line 17 with the following replacement paragraph:

Generally, the The apparatus in embodiments of the present invention uses the SIDMS ~~IDMS~~ method for In-process measurement, using an Atmospheric Pressure Ionizer coupled to a Mass Spectrometer (IP-API-MS). The IP-API-MS apparatus is designed for identification and quantification of elemental contaminants or compounds and species in fluids without reliance upon a high temperature argon plasma for equilibrium or requiring a high-pressure liquid chromatography HPLC separation step prior to measurement.

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